

Student Name: _____ Class: _____ Score: _____

8.NS.2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.

A. Find the decimal form of each value to the nearest ten thousandth (3 decimal places) and determine if the following values are rational or irrational.

1. $\sqrt{16}$

3. $\sqrt{8}$

5. $\sqrt{324}$

2. $\frac{\pi}{2}$

4. $\frac{2}{3}$

6. $\frac{4\pi}{2\pi}$

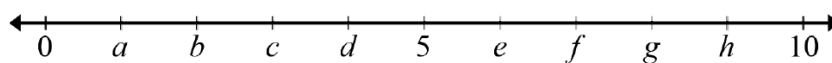
B. Determine if an exact solution can be found for the following measures.

7. ☐ y ☐ n The area of a rectangle.11. ☐ y ☐ n The surface area of a cylinder.8. ☐ y ☐ n The area of a circle.12. ☐ y ☐ n The area of a rectangle.9. ☐ y ☐ n The perimeter of a triangle.13. ☐ y ☐ n The volume of a sphere.10. ☐ y ☐ n The volume of a cube.14. ☐ y ☐ n The hypotenuse of any triangle

C. Answer the following questions about irrational numbers.

15. Can the area of a rectangle ever be irrational? If it is possible, provide an example.

D. Use the number line below to determine where each of the following values would be located.



16. $\sqrt{10}$ is between _____ and _____.

21. $3\sqrt{3}$ is between _____ and _____.

17. $\sqrt{4} + \pi$ is between _____ and _____.

22. $\sqrt{5} + \sqrt{7}$ is between _____ and _____.

18. $\frac{2\sqrt{18}}{\sqrt{16}}$ is between _____ and _____.

23. $\frac{\sqrt{12}}{2}$ is between _____ and _____.

19. 2π is between _____ and _____.

24. $3\sqrt{5} - 2\sqrt{2}$ is between _____ and _____.

20. $\sqrt{45}$ is between _____ and _____.

25. $6\sqrt{5} + 2\sqrt{3} - 4\sqrt{2}$ is between _____ and _____.

E. Order the following sets of numbers from least to greatest.

26. $14, \sqrt{18}, 4\pi$

31. $3\sqrt{15}, 2\sqrt{21}, 4\sqrt{12}$

27. $22.2321, \sqrt{625}, (5^2 - 1)$

32. $\sqrt{125}, \sqrt{34} + 20, 10\pi$

28. $(-1)^2, \frac{\sqrt{145}}{10}, \frac{\pi}{4}$

33. $\frac{9\sqrt{22}}{3}, \sqrt{196}, \sqrt{200}$

29. $3^2, \sqrt{95}, 2\pi$

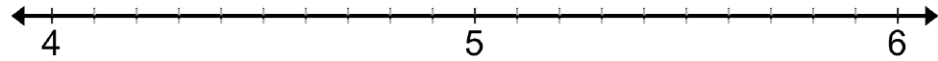
34. $\sqrt{25} + \sqrt{100}, \sqrt{50} + \sqrt{75}, \sqrt{35} + \sqrt{90}$

30. $\sqrt{132}, (\sqrt{8})^3, 5\sqrt{25}$

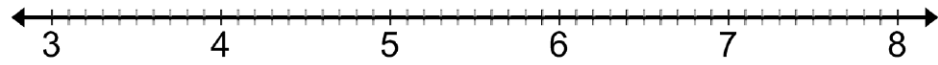
35. $2^4, \sqrt{272}, \frac{33}{2}$

F. Without using a calculator, plot the following values on the number line.

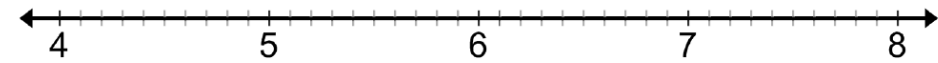
36. $2.2^2, \sqrt{26}, \frac{3\pi}{2}$



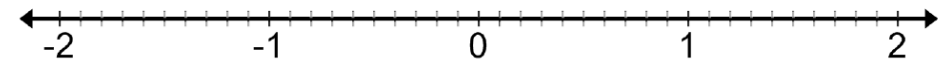
37. $2\pi, \sqrt{38}, \sqrt{52}$



38. $2.75^2, \sqrt{18}, \frac{3\sqrt{16}}{2}$



39. $1.5^2, -\sqrt{2}, \frac{\pi}{2}$



40. $(-1.4)^2, -\sqrt{3}, 0.1^2$

